

NOTES

ON

SMALL-POX AND ITS TREATMENT

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IN publishing the following notes, the object has been to lay before the profession (more particularly its junior members and those who have not been brought much into contact with small-pox), a concise account of that disease and its complications, and such hints relative to treatment as have suggested themselves in daily experience.

The author does not intend to imply that the subject has hitherto been neglected or unskilfully handled, but the large resources at his command have appeared to him a justification for attempting to add something more to the large amount of information already collected.

Much that appears in the succeeding pages is well known and accepted; nothing, however, has been brought forward upon practical points but that which is the result of experience and observation.

Many shortcomings may perhaps be detected: the treatise makes no pretension to completeness—the subject-matter yet remains in abundance. The author has, however, tried to present a clear and

practical account of the malady, not without hope that the suggestions will be of service both as aids to diagnosis and treatment.

The characters of small-pox are:—

(a) That it has a definite and uniform time of incubation, or in other words, a precise 'latent' period, and which is almost invariably fourteen days ;

(b) An eruptive fever of forty-eight hours' duration ;

(c) A period of maturation of from seven to nine days ;

(d) A secondary fever of usually three or four days more ;

(e) It attacks the individual generally but once in a lifetime ;

(f) It is the result of a material and portable poison, capable of being conveyed from place to place, and communicated from individual to individual ; the poison entering the system either with the air, through the lungs, or by direct contagion by means of the skin.

Until twelve days after the patient has become infected with small-pox, usually little or no inconvenience has been experienced—he has not had any feeling of illness, and has performed his daily duties as before ; then rigors occur, accompanied by headache and severe feeling of illness ; there is pain in the back of a most severe character ; frequent pulse ; a high temperature of skin (104° — 107° F.) ;* a

* Although the temperature may reach this high point at the onset of the disease, it is not to be considered necessarily fatal.

whitish furred tongue; occasionally diarrhoea, but more generally constipation; sometimes convulsions (in children), violent delirium, or coma.

The pain referred to the back and loins is most distinctive of the disease, and by it alone, especially when the patient has been exposed to the contagion of small-pox, a correct diagnosis may frequently be arrived at. Until the last few years this pain has been considered to be muscular, but it is evidently of more serious importance, and probably arises from congestion of the spinal cord. In several instances when the pain was more than ordinarily severe, the patients were bereft of all motor power in the lower extremities; and in others, no other symptom presented itself from the time of admission until death. Upon a post-mortem examination of these, the lower portion of the cord was found highly congested, and in one or two cases a layer of lymph effused over its anterior surface. Trousseau refers to the same in the following words:—"Cette rachialgie n'est pas comme on l'avait cru une douleur musculaire, elle dépend d'une affection de la moelle épinière en voici la preuve; dans un assez grand nombre de circonstances le douleur lombaire est accompagnie de paraplegie." He further adds that the same produces retention of urine; this we have never seen.

After the fever has continued for about forty-eight hours—

"A most instant tetter barks about
Most lazar-like, with vile and loathsome crust, all the smooth body."

It is necessary to pay close attention to the eruption, inasmuch as the diagnosis between small-pox and the other exanthemata up to this period must be to a

certain extent conjectural. At a time then, let us say, from thirty-six to forty-eight hours from the commencement of the fever, papules are seen to arise in the following order:—The forehead is the part which is first the seat of the eruption, which consists in the first instance of minute pimples, hard, globular, and communicating a curious sensation to the fingers, not inaptly compared to a shot under the skin; they are surrounded by a redness of the skin, which generally disappears in a few days; after the face the eruption usually shows itself on the back of the wrists, then on the trunk, and finally on the lower extremities. From observation, those on the legs do not show themselves until about forty-eight hours after those on the face have appeared; or, in other words, the eruption on the upper part of the body will have appeared on the third day of the fever, but those on the legs not until the fifth day; the papulæ enlarge gradually, become vesicular and umbilicated on the second day, and ripen into pustules by the eighth day. In three days more a dark spot appears on the top of each pustule, and at this place it spontaneously breaks, and a portion of matter oozes out, in consequence of which the pustule is shrivelled and subsides, while the matter discharged dries and forms a crust upon its surface. Sometimes a little only of the matter oozes out, that remaining in the pustule becoming thick and hard. The pustules thus burst and dried up, form the scabs or scales, which occupy an indefinite time before they are cast off; those on the upper part of the body having first appeared, of course are the first to burst

and dry up, so that in one patient we have the same disease in two totally distinct stages.

The quantity of eruption varies according as the patient has been wise enough to be protected by vaccination or not, and also in an exact measure of the extent to which the poison has taken effect. Patients present themselves sometimes with not more than a dozen papules over the whole body, whilst in others they number as many thousands; hence has arisen the necessity for dividing small-pox into varieties.

So long as the pustules remain totally distinct from one another upon the face, the case is termed "discrete."

When some remain distinct and others coalesce, it is termed "semi-confluent."

When they unite and form irregular clusters or patches, or are all associated in one mass, it is known by the name of "confluent."

When they are formed into clusters like those of ivy-berries, the botanical term of "corymbose" * is applied.

When the eruption is either altogether absent, or but sparsely and quasi developed*, and associated with hæmorrhage from one or more mucous surfaces, with large black and bluish patches resembling bruises, the skin of the whole body of a dull leaden hue, and exhaling an odour somewhat resembling rotten fish, with intense pain in the back, and with

* From "corymbus," a cluster or bunch of ivy-berries.

the intellect remarkably clear, the case is termed "malignant," or "black small-pox."

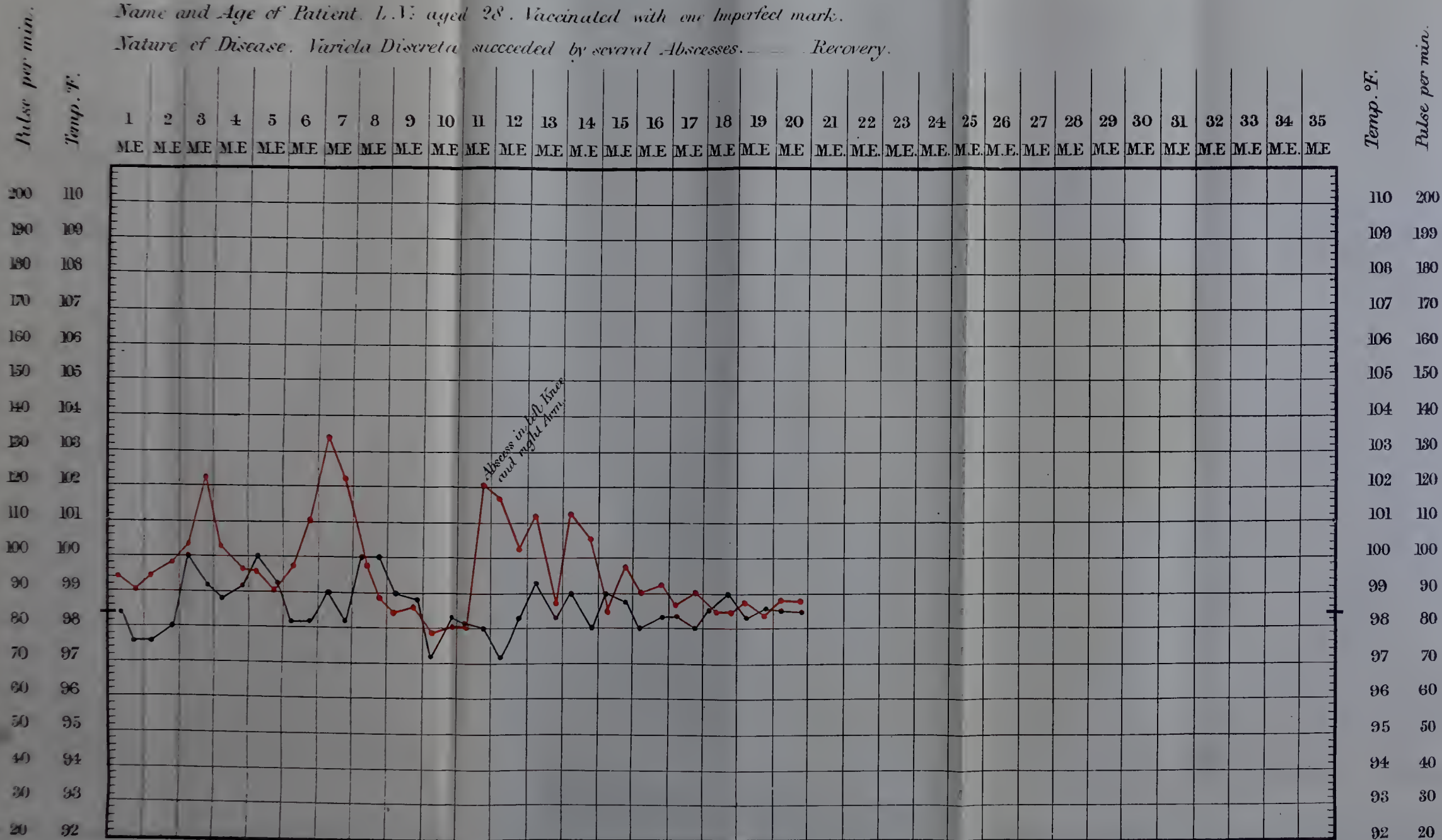
When the axillæ, abdomen, groins, and lower border of the breasts are covered with dark petechiæ, but without patches like bruises, combined with a moderate amount of eruption elsewhere, but with conjunctivæ injected, hæmorrhage from nose, lungs, bladder, bowels, or uterus, delirium varying in intensity and amount, we apply the term "hæmorrhagic."

Another kind, called "*variola benigna*," is sometimes seen, and may easily be mistaken for varicella. It consists of an eruption in various stages of development, some of the pocks drying up, whilst others are either maturing or beginning to appear; the fever at first runs high, but soon subsides again; there is no secondary fever, and no pitting. During the late epidemic a large number of this class came under notice; some occurred in the vaccinated, some in the unvaccinated.

Variola Discreta.—In the discrete form of small-pox, the eruption generally follows precisely the course which has already been indicated, the pustules becoming distended and spherical from containing pus, but keeping the central depression, which is owing to the adhesion between the cuticle and cutis vera. As the pustules increase in size, if they be numerous on the face, the surrounding parts about the eighth day become more or less swollen, so that the natural appearance of the patient is completely altered, and frequently so greatly as to prevent recognition by the nearest friends; about the tenth or eleventh day, a dark spot appears on the summit of each pustule,

Name and Age of Patient. L.V. aged 28. Vaccinated with one imperfect mark.

Nature of Disease. *Varicella Discreta* succeeded by several Abscesses. — Recovery.



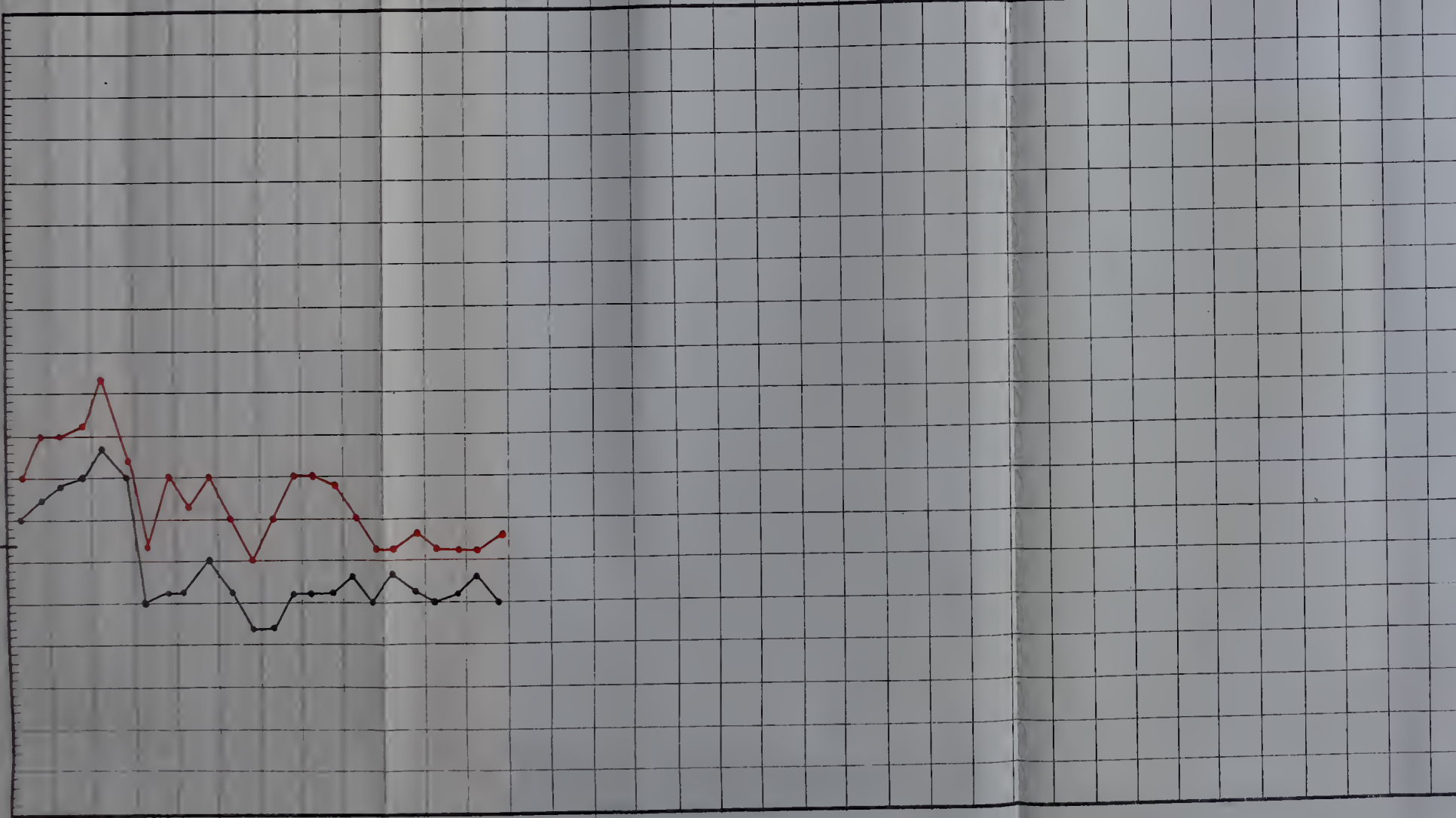
Name and Age of Patient . E.P. aged 14 . Vaccinated with 4 Imperfect marks .
 Nature of Disease . Variola Discreta . Recovery .

Pulse per min.

Temp. F.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	

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Temp. °F.

Pulse per min.

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the cuticle breaks, and the pus escaping, forms a yellowish crust; the pustule itself contracts, dries, and forms a scab, which in a few days falls off, leaving a dark reddish mark on the skin, at first elevated, but which afterwards contracting, presents a depression or "pit," but there is no true "pitting" unless the cutis vera ulcerates. This is the course of things on the face, and successively the pustules on the body follow suit. The matter, however, of the pustules on the hands and arms is frequently absorbed, so that at the height of the disease they appear as empty vesicles. In this form of small-pox the fever at the onset may be very high, but as soon as the eruption is well established, the symptoms abate, returning again at the stage of maturation. The following charts show the rise and fall of temperature registered in the several periods of this type of the disease.

The *prognosis* in discrete small-pox is favourable, except when it occurs in very young children about the time of teething, and in whom convulsions are likely to occur.

Variola confluens differs from the previous form in the greater severity of all the symptoms: the headache is violent, the delirium is very great—sometimes suicidal; the eruption appears earlier, and in very much greater quantity, of a smaller size than in the discrete form, and running one into another so as frequently to form one entire vesicle, having a hard and inelastic feel; the eruption being developed, the temperature usually falls, and *may* keep near the standard point until the eighth day; generally, however, it continues higher than normal throughout the whole course of

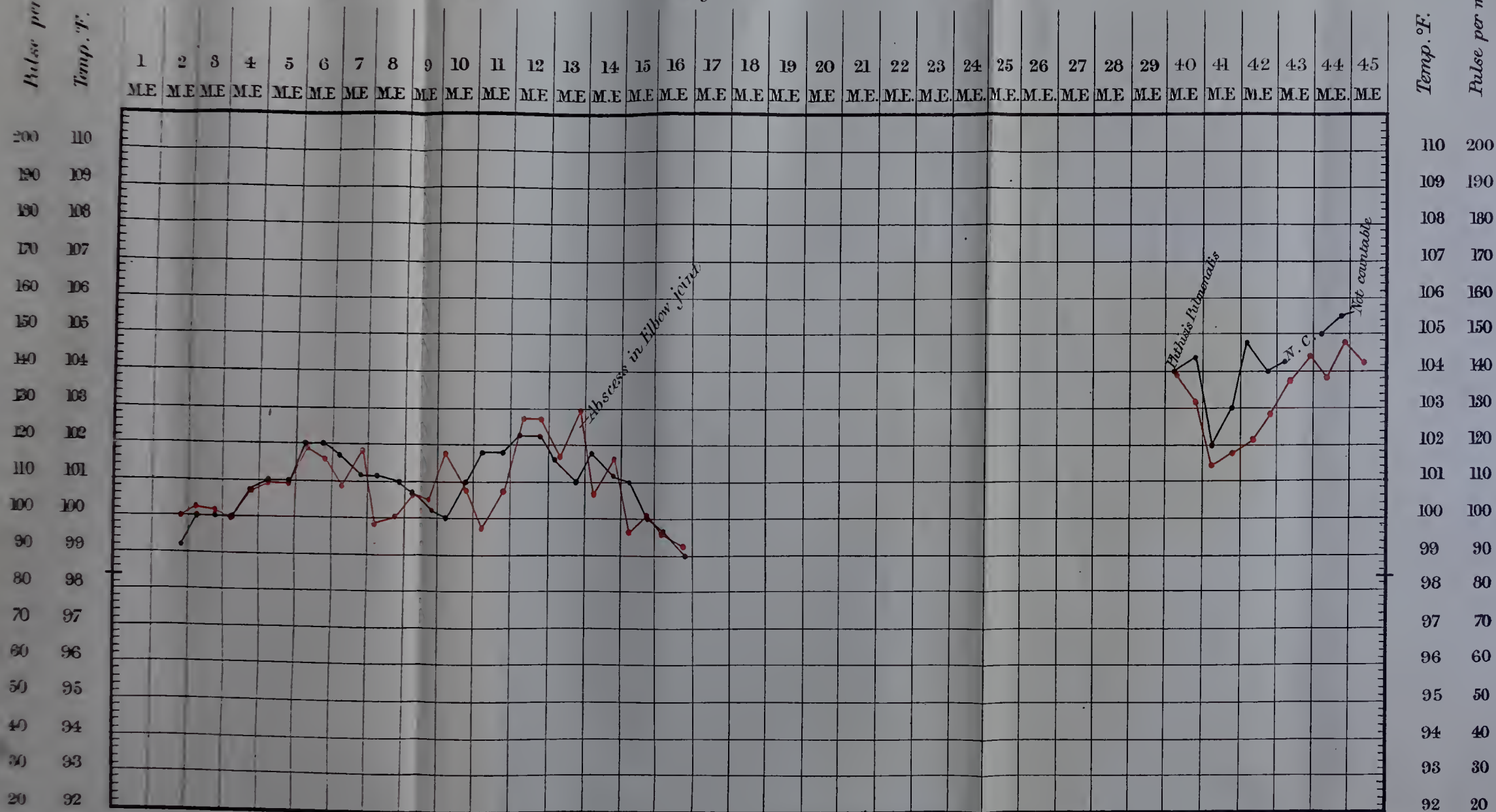
the disease. At this time (the eighth day) the vesicle changes in appearance: from a dirty-white colour it becomes yellowish, the temperature also becoming higher, and the pulse quicker; in three days more, the pustules, beginning to empty themselves, emit a horrible stench, the nostrils and ears are blocked up, the eyes, unless assiduously bathed, are glued together—the patient presenting altogether the most pitiable and at the same time most repulsive object it is possible to conceive. Superadded to these misfortunes, there is swelling of the lips, enlargement of the tonsils, profuse ptyalism, swelling of the cervical, axillary, and inguinal glands; and from the eruption invading the larynx, constant and distressing cough and dyspnœa. In children about this time laryngitis not uncommonly supervenes, and is generally a fatal complication; if the case proceeds to a favourable termination, the temperature will now (tenth or eleventh day) fall, the pulse will decline, and all inflammatory symptoms cease; but unfortunately in almost an equal number of cases the result will be the reverse.

In the confluent class, when the eruption is scarcely elevated above the surface of the skin of the face and body, is flattened and without form, never fully maturing, and of a pasty-white colour, the suggestive term of “suppressed” has been applied. The temperature in these cases is, as a rule, low, there is marked depression of the vital powers, the extremities are generally cold, and the patient is uneasy and restless. It is a most fatal form of the disease.

Prognosis.—The prognosis will depend principally upon five things:—

Name and Age of Patient. W. W. aged 23. Vaccinated with 2 Imperfect marks.

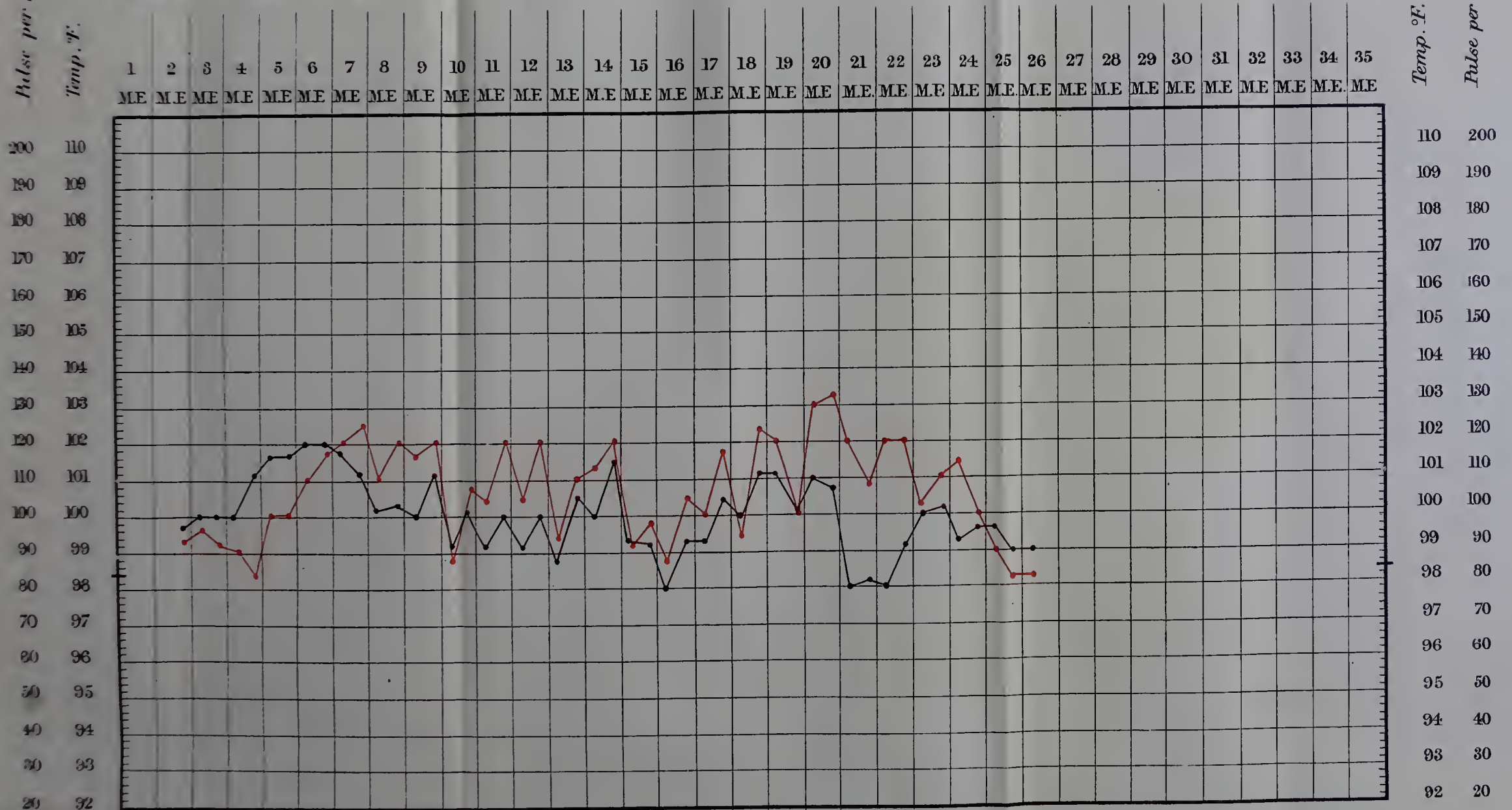
Nature of Disease. Variola Confluens. Abscess in Elbow joint. Phthisis Pulmonalis. — Death.



From the second day of the eruption until the twelfth the disease followed a normal course, on the 14th suppuration had taken place in the left elbow joint, the abscess being opened slight necrosis of the condyle of the Humerus followed until the 40th day the patient was apparently gaining strength but he had suffered (without mentioning it) from occasional attacks of Diarrhoea the physical signs were those of softening in both apices and vomice posteriorly in left lung, there was but little cough.

Name and Age of Patient. J. E. aged 31. Vaccinated but without marks.

Nature of Disease. Varicla Confluens. Brencho Pneumonia. ——— Recovery.



Name and Age of Patient. J. E. aged 31. Vaccinated but without marks.

Nature of Disease. Variola Confluens. Broncho Pneumonia. Recovery.

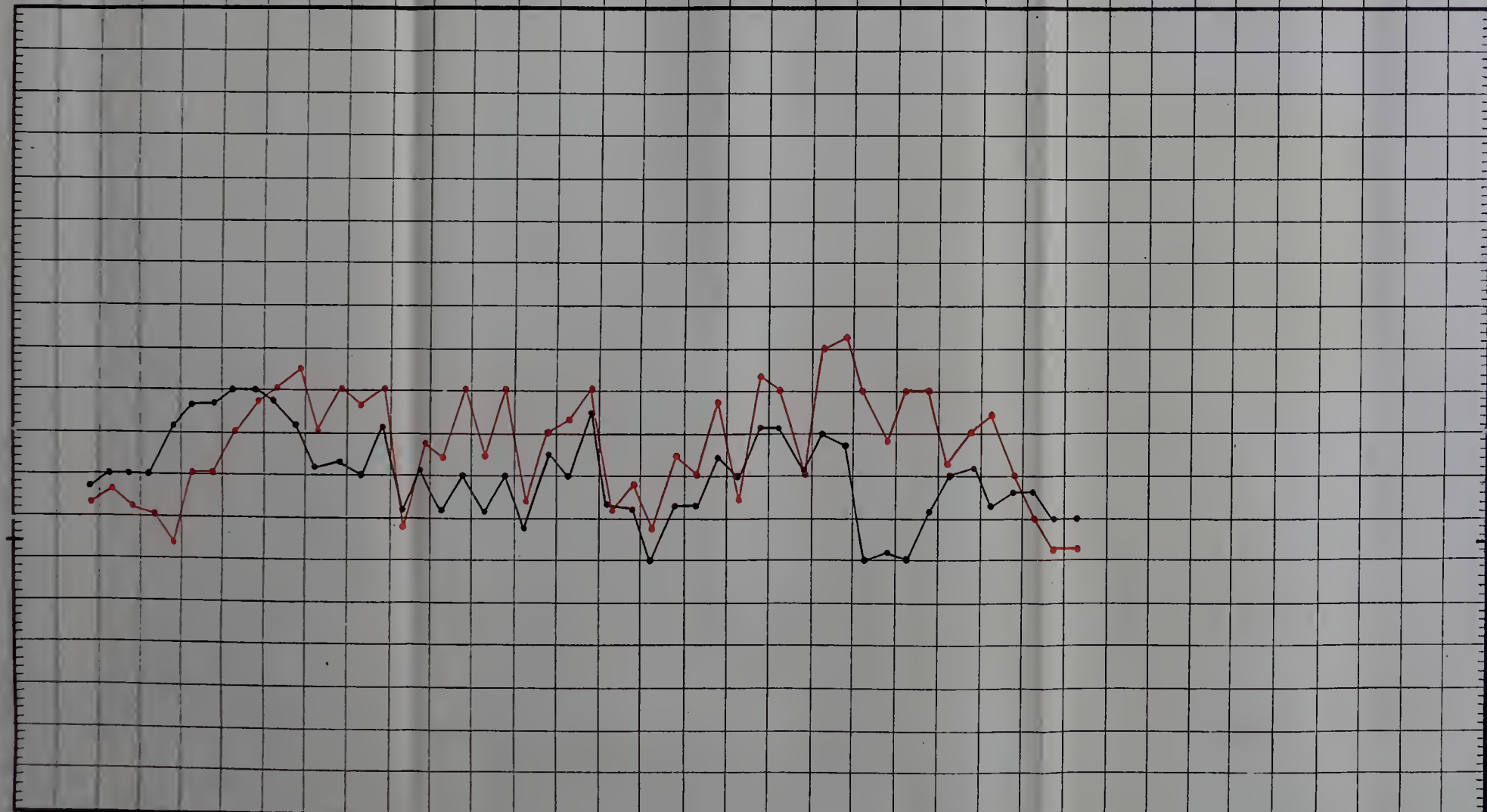
Pulse per min.

Temp. °F.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME

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Temp. °F.

Pulse per min.

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- (a) The amount of eruption ;
- (b) The former habits of the patient ;
- (c) If vaccinated or not ;
- (d) The nervous sensibility ;
- (e) The age.

The amount of eruption forms an important consideration ; believing that each pustule is nothing more nor less than a cyst containing matter, it follows that every additional one abstracts so much from the animal economy as to render the powers of life less capable of bearing up against the extra work put upon them ; if, therefore, the eruption is covering the face, arms, and hands in a truly confluent way, if upon the face it would be impossible to place the point of an ordinary pencil without its being touched on all points of its circumference by a pustule ; if, moreover, the eruption is pale, flattened, or presenting a dark spot on all or the majority of the pustules, the chances are by far against the recovery of the patient ; but if, on the other hand, the papules are plump with a reddened base, a moderate amount of œdema of the face and hands, and the patient is able and willing to do what he is told, a chance of recovery remains.

The former habits of the patient to a great extent influence the result. Barmen, dock labourers, sailors, sugar bakers, and such like, bear the disease badly ; being for the most part given up to habits of intemperance, and the glass very frequently taking the place of the plate, the vital powers become undermined, and they readily fall victims to the disease. Prostitutes of the lower class for the same reason are bad

subjects for small-pox. On the contrary, men who have lived regularly and moderately appear to pass through the trial with more satisfactory results than the "bon vivants." Taking small-pox patients generally, it is those commonly called "healthy" that are attacked; we wish it to be understood by this, that although other disorders are frequently superadded to small-pox, small-pox but rarely succeeds phthisis, scrofula, and other known diseases. It becomes necessary therefore to take into account the former habits of life.

If vaccinated or not, occupies the most important place of all in estimating the danger from small-pox. If the cicatrices to be seen are two or three in number, and of fair quality, the case is almost sure to do well; but if there is only one, and that imperfect, the result is rendered very doubtful. Many patients are seen in hospital practice, who state that they have been vaccinated, but no cicatrices of any description can be discovered; in a prognostic and statistic point of view it is better, and indeed necessary, to class them as "unvaccinated." We are not to doubt the fact that they had submitted themselves to the operation, but we must doubt very much that the operation had been performed successfully; in other words, we consider them to be as much unprotected as if the so-called vaccination had never been done.

The following table shows the relative value of the number of marks in relation to the mortality:—

Vaccination Marks.	Admitted.	Died.	Mortality per cent.
None.	1006	377	37·47
1 mark.	420	53	12·61
2 „	601	51	8·48
3 „	295	21	7·11
4 „	127	4	3·14
5 or more.	79	2	2·53
Total . .	2528	508	20·09

So that it is clearly seen that those who are *not* vaccinated die at the rate of more than 37 per cent., those with one vaccination cicatrix at above 12 per cent., with two cicatrices at about $8\frac{1}{2}$ per cent., with three cicatrices at a little over 7 per cent., with four cicatrices at $3\frac{1}{7}$ per cent., whereas with five or more cicatrices the mortality is reduced to $2\frac{1}{2}$ per cent. We may here observe that no distinction has been drawn between the good, bad, and indifferent cicatrices, inasmuch as a great difference of opinion may exist respecting the quality of any given case, and that which is probably regarded by one observer as a good mark, may be considered by another as a bad or imperfect one, and *vice versa*. Beyond doubt, before we are qualified to unhesitatingly pronounce the character of a vaccine cicatrix, the experience and opportunity for observation should have been extended over some thousands of cases. On the other hand, by simply taking the *number* of marks, which can be verified by the merest tyro, all dispute must at once and for ever be set at rest.

The nervous sensibility of a patient influences to a great degree the ultimate result. Patients have been frequently noticed who have exhibited gloomy forebodings from the first; these have done badly, although perhaps suffering from the milder forms of small-pox; whilst, on the contrary, those who have had what may be called a determination to get well, have succeeded in recovering convalescence when the case has been of an almost hopeless description. Constant anxiety produces sleeplessness, resignation and hope favour the most perfect repose of body and of mind. The nervous condition then should be greatly thought of when giving an opinion as to the ultimate probable result.

Age forms an important prognostic datum; because at certain periods of life it is proved that the system bears the disease in a much better and more favourable manner than at others. At the Homerton Small-pox Hospital the following results are shown:—

RATE OF MORTALITY.		
	Unvaccinated.	Vaccinated.
Before 5 years of age . .	57·2	14·28
Between 5 and 10 years	40·86	7·48
" 10 and 15 "	26·24	1·74
" 15 and 20 "	21·76	5·68
" 20 and 25 "	54·55	9·4
" 25 and 30 "	48·83	10·06
" 30 and 35 "	38·33	15·7
" 35 and 40 "	34·48	27·4
" 40 and 45 "	39·13	29·
" 45 and 50 "	46·15	23·
" 50 and 55 "	41·66	23·

So that it is seen that the most favourable time for enduring small-pox is about the age of puberty, and the worst or most dangerous periods, those of early childhood and advancing life. Unvaccinated children are invariably bad subjects, inasmuch as, as it has been⁴⁶ stated before, the disease is frequently associated with some disorder of the nervous system, or the latent seeds of scrofula are rapidly and fatally called into activity.

We now pass on to consider the *treatment* to be employed in the confluent form of small-pox. It is of the first importance that there should be secured a large airy apartment, divested of all superfluous furniture, and the bed deprived of all hangings. It is necessarily difficult to obtain a cubic space in private dwellings equal to that of an hospital, in which 2000 cubic feet are allowed to each patient; but at all events we should insist upon his occupying the largest and best ventilated apartment in the house. The rash being seen then to be invading the skin in the way already described, it is advisable (nothing preventing) that the patient should be placed in a warm bath of about 93° F., and carefully sponged all over the body by means of a soft sponge, and at the same time the hair and whiskers should be removed by cutting them as close as possible; he is then to be clothed in a clean linen dress and placed in bed. If any sensation of cold is experienced, an extra blanket should be added. Except when the thermometer registers a degree or two of frost, the windows should be kept open at the upper part, the temperature of the room being increased by a good coal fire. The primitive mode of restricting small-pox patients to a gruel-and-milk diet is, we

trust, exploded : there does not appear any sound reason in lowering the vital powers of one who is about to undergo a most exhaustive disease. At the same time it is necessary to guard against an opposite ~~extreme~~ extreme course : it is neither proper nor judicious to give solid food, but the exhibition of beef tea, eggs, jellies, arrowroot, and so forth, is not only not contra-indicated, but is generally necessary. Patients throughout the disease are very solicitous for cold drinks, more particularly cold water, and nurses as a rule as obstinately refuse them. We have always allowed cold water to be drunk whenever asked for, and have never seen any bad result ; we therefore strongly advise that they should be plentifully supplied with either water as taken from the pump, or cold lemonade, toast-and-water, or, what is still better, cold milk. Encourage the patient by all means to drink milk, because the time will come when in all probability he will refuse everything else. The question of the administration of wine or spirit is a difficult one to settle ; it requires much experience to know when is the proper time for giving it with benefit. If the papules are coming out freely and with a good areola around their bases, it is not called for ; but if the eruption is delayed, or it is flattened and of a dirty-whitish colour, or failure of the powers of life may be anticipated, the pulse also becoming more compressible, we may administer wine or whisky, or brandy. The body should be sponged with lukewarm water, at least once a day, and dried with a soft old towel ; the linen should also be changed at the same time. With a hot, dry skin, nothing is more grateful than sponging ; it is also

desirable to have two beds, so that the patient may alternately occupy the one and the other. The bowels, usually constipated at the onset, may be relieved either with castor oil, an ordinary black draught, or a seidlitz powder, but exhaustive purging must be guarded against. We may also prescribe—for unless something is given in the form of medicine, the impression on the sick man's mind is, that you are doing nothing to assist him—a little effervescing saline, composed of bicarbonate of potash and lemon-juice, every four hours. The sore throat that almost always accompanies small-pox is much relieved by either an acid gargle, or one composed of nitrate of silver (gr. j ad ʒj). Delirium, which is frequently present at the commencement, requires judicious management; it is frequently of a suicidal character, and unless carefully watched it is more than probable that the patient will escape from the ward, or in some other way do himself serious mischief; knives and all other cutting instruments should be removed from the room, and he should by no means be left a single moment unattended. The question of employing mechanical restraint is a vexed one, some authorities maintaining that it is not only justifiable but advisable, whilst others look upon it as simply mischievous, and as a means only to evade careful nursing. From our own experience we can affirm that we have never found it necessary, but it should be borne in mind that we have always had plenty of nurses and other assistance at hand. In a case occurring in private practice the matter assumes a totally different aspect, only one or two persons at the most being at command, the patient being possessed of con-

siderable muscular power, and the relatives alarmed both at the disease itself and the horrible appearance the patient presents. Under these circumstances possibly it might be not only kindness to the patient himself, but to those around, that some mechanical restraint should be enforced. The way this should be done must be left to the medical attendant himself—certainly not to the nurse. It is almost impossible to lay down any decided plan. The manner that suggests itself to our mind is simply to place a broad sheet across the chest, and secure the ends by tying beneath the bedstead. However, as said before, we can give no advice from practical observation upon the subject. To soothe the delirious fancies it is necessary to exercise a vast amount of tact: frequently we have been able to quiet and restore to a calm state of mind those who a few minutes before exhibited the wildest phases of delirium. A decided and at the same time a quiet tone of voice and manner effects a mastery when a rough and almost brutal treatment has quite a contrary result. Be careful not to contradict your patient: what he imagines, is a reality to *his* brain, and not a delusion as we know it to be. Humour him—do not attempt argument, it is time and patience thrown away. Narcotics are sometimes useful, but very often without effect. Chloral hydrate is very variable in its results, the injection of gr. $\frac{1}{4}$ or gr. $\frac{1}{8}$ of morphia hypodermically has answered better in our hands than aught else; we would recommend a trial of this before having recourse to any other means. Children very rarely show symptoms of delirium; in them convulsions appear to take its place. In some (especially those who have

been in the habit of taking freely of alcoholic drinks), a moderate dose of spirit will act quickly and well; its indications are often well marked.

When the scabs have fully formed upon the face and elsewhere, another feature of the disease arises to which it is necessary to direct some special attention. To prevent pitting is impossible, but to relieve the troublesome itching and horrible foetor is practicable and easy. We have at hand a choice of applications. Carbolized oil, made by mixing 3j of pure carbolic acid with 6 or 7 parts of olive oil, answers admirably. It should be painted over the face and whole of the body every two or three hours with a soft brush. The only objection to it is the smell, which in some patients produces nausea and even vomiting; it, however, deserves a trial. Condyl's fluid is an excellent deodorizer, and should be applied with a rag several times folded and shaped like a mask, soaked in the fluid, and changed as often as it becomes dry. In those cases where the pustules are very confluent but do not desiccate, but remain soft and sloughy-looking, a poultice of crushed linseed in which some charcoal is mixed, is advantageously used; in forty-eight hours the whole is removed, leaving a raw surface, which can be constantly smeared over either with simple olive oil, or a cerate in which otto of roses is added. Glycerine alone or mixed with starch powder, or glycerine and oil together (equal parts), we have sometimes employed; but the first and second are, in our opinion, the most efficacious.

When cases come under treatment before the eruption has appeared, or even within the first forty-eight

hours, the old itch lotion (lot. sulph. c. calcê) will be found very valuable. It has been employed here in some hundreds of cases, and with the most satisfactory results. To insure its success the patient should be rubbed with it over the whole body every four or six hours, and persevered with thoroughly and well until the sixth or seventh day; it acts directly upon the papules, completely destroying them, and thus, by preventing their reaching the stage of pustulation, the patient has not to undergo the severe secondary fever. We apply it here in all the cases that come under observation early, and hitherto our faith in it remains unshaken.

The results from the medicines employed for the cure of small-pox have not upon the whole been satisfactory. Although up to the time of the secondary fever, we may do next to nothing in the treatment by drugs, when that has arrived our consciences seem to tell us that something more is demanded; with a high temperature, a quick pulse, a dry, brown tongue, and so forth, the medicines which seem to be chiefly indicated are those which we should employ in typhus and other adynamic diseases. But, much as it is to be regretted, we find by experience that they do not appear to exert that influence in small-pox that they do in other disorders. In a large number of cases we have exhibited bark and ammonia and wine; to others the tinct. of perch. of iron; and to many the sulphocarbolates. In the latter part of the late epidemic our attention was directed to the use of quinine in large doses (gr. x to gr. xv every four hours), and upon the whole with happy results. The effect upon the temperature

is very marked, one of 103° or 104° being frequently reduced within twenty-four hours to 100° , 99° , or even to the normal standard. Many in whom recovery seemed hopeless succeeded in establishing convalescence; but it is unwise to extol a remedy which has not yet stood the test of long experience. Nevertheless, we are of opinion that on this or some similar principle the best results will be obtained. Of course it is necessary whilst administering quinine in such large doses, to carefully watch its effects. We cannot remember having seen anything serious arise, but the liability is great, and should be jealously guarded against. Stimulants, in the form of whisky, brandy, or wine, will also probably be required at the same time.

Perhaps the most recent plan of treatment that has been suggested is that by vaccination, the operation being performed after the papules have become developed. Hitherto it has been believed that vaccination to be effective at all must have reached the eighth or ninth day of its progress, and to our own mind this theory is the correct one. Over and over again we have seen children and adults who have been vaccinated as a precautionary measure (small-pox perhaps having broken out in the house in which they were living), in whom three, four, and five good recent vaccinia vesicles were visible; nevertheless the disease itself passed through the usual stages and was unmodified, and several, unfortunately, fell victims to the attack. When the matter was brought so prominently before the profession by the *Lancet* and other journals, we were induced to give it a trial, the result being in every case most unsatisfactory. We

consider it a very happy means to bring vaccination into the utmost discredit.

During the secondary fever, or soon afterwards, complications or sequelæ are likely to arise. They are as follows :—

Boils or Abscesses.—These vary in size and also in number. Sometimes there are but one or two, consequently producing but slight inconvenience; at other times the body, but more frequently the head and face, legs and arms, are literally covered with them, and they produce almost as much distress as the small-pox itself. They are very tedious in their progress, and often leave behind them ulcers which are difficult to heal, and prevent the patient leaving his bed. When they form on the face they frequently produce considerable disfigurement. Those which cause most distress should be opened by the lancet and afterwards poulticed; the diet should also be generous. Frequent warm baths wonderfully assist in producing convalescence.

In those who have barely escaped with life after a severe attack of small-pox, *pleuritis* is not a rare sequela. It occurs suddenly with severe pain in the side, dyspnœa, great difficulty in drawing a deep breath, frequently accompanied by a short cough. The pulse is quick and wiry, the skin dry and burning hot, and the temperature much increased. The result, as a rule, is all but hopeless; some, however, who have a good constitution recover, but after a very prolonged convalescence. The use of large and hot linseed poultices, or in some a blister, appear to be the means indicated.

Pneumonia follows the reverse mode of procedure to the previous disorder. It comes on slowly and insidiously, and unless the temperature is taken daily, may be altogether overlooked. We believe it to be more common than pleurisy in children, and it is very much more frequently recovered from. Whenever there is a dry, pungently hot skin, quick pulse, and the thermometer has suddenly risen to 102° F., 103° F., or more, we suspect pneumonia. The treatment employed here has consisted of jackets of linseed meal repeated every two hours, care being taken that the cold one is not removed until the hot one is ready for application. The carbonate of ammonia or chloric æther combined with infusion of senega is also efficacious.

Bronchitis is another serious disorder, particularly when it occurs in old people, or is associated with small-pox from its very beginning. Its treatment must be according to the recognised rules.

Glossitis is occasionally seen during the time of the secondary fever; its symptoms are distinct and not to be mistaken. The patient's articulation is at first imperfect, and there is a difficulty in swallowing fluids. Upon opening the mouth the tongue is seen immensely swollen and dry; in two or three instances we have seen it so much enlarged that a portion has been protruded between the teeth. It is invariably a fatal symptom.

We can give no satisfactory directions as to the treatment of this complication. The plan we have adopted has been to rub the whole dorsum of the tongue with a stick of nitrate of silver, and syringe the mouth frequently with some disinfecting fluid.

The patient should also be encouraged to suck ice frequently, at the same time the use of nutrient enemata must not be neglected.

Otitis, or inflammation of the ear, occurs almost at any time during the period of convalescence. It has been seen as late as the fifth week. It commences with severe pain referred to the ear and down the side of the face; relief is at once afforded by the abscess bursting, but permanent deafness is sometimes the result. *Treatment*: syringing the ear with warm water or decoction of poppy-heads, and morphia to procure rest at night.

Inflammation of any of the abdominal viscera is rarely seen, except in those cases where labour has set in during the course of the disease; the form it then assumes is that of *metro-peritonitis*, and does not differ in any way that we know of from the same affection when seen under ordinary circumstances.

In children *tubercular peritonitis* more frequently appears, consisting of a deposit of tuberculous matter on the surface of the peritoneum in various forms—either gluing the intestines together into one indescribable mass, or causing contractions, with little deposit of lymph, but a quantity of fluid. The symptoms are not well marked: there is some pain, the patient lies upon the back with the knees drawn up, the abdomen is tumid, but resonant upon percussion; there is sometimes vomiting, and the condition of the bowels is variable; there are also the usual symptoms of hectic (in the advanced cases), such as evening sweating, burning heat of the soles of the feet and palms of the hands, and turbid urine. In

the majority of cases, unless the disease is arrested in the early stages, it leads to a fatal termination.

Our *treatment* consists of poultices, counter-irritation, compound ipecacuanha powder combined with mercurials.

Laryngitis comes on suddenly and is rapid in its course. The patient complains of pain in the throat, and has an anxious expression of countenance; there is then difficulty in swallowing; the voice becomes altered in tone, and gradually sinks into a whisper; there is also difficulty of breathing, the air being drawn into the lungs with a hissing or whistling sound; the cough invariably present is harsh and of a metallic or crowing character. There is, moreover, a sense of tightness referred to the chest and upper part of the larynx; this is also tender upon pressure. The distress increases hourly; the pain and difficulty of swallowing and speaking become so severe as to check, to a certain extent, the attempt being made. In children the head is thrown back, and the clavicles are raised. After a time varying in proportion to the severity of the attack, the countenance becomes livid, the attempts to obtain air become a severe struggle, and the patient dies of apnœa.

We are unable to adopt the same kind of *treatment* for laryngitis after small-pox that is employed under other circumstances; the means left at our disposal are few, and usually, unhappily, without success. Clearly the use of antimony, calomel, leeches, and other depleting measures are inadmissible; we are therefore obliged to content ourselves with the application of hot fomentations and poultices, and the

inhalation of steam, at the same time placing the patient in a warm room into which the steam of hot water passes. This is effected very easily by keeping a kettle of water always on the fire, and affixing to the spout a tin tube or roll of thick paper. When the disease is so far advanced as to threaten suffocation, the question of tracheotomy arises. From our own experience we are unable to speak in favour of it: it has been done in several cases under our care, but with no beneficial result. In a perfectly hopeless case, however, and when all other means have been tried and failed, it becomes at least a justifiable operation.

Phthisis. — In those of a tuberculous diathesis, small-pox, like many other diseases, brings into activity that which perhaps might have remained latent during the whole period of life. We have often seen those in whom no lung affection was ever suspected, and who previously had not known an hour's illness, rapidly pass through the several stages of phthisis when recovering from a severe attack of confluent small-pox. It becomes necessary then to keep a watchful eye upon those patients in whom there is some hereditary predisposition to this disease, in order to prevent them exposing themselves to sudden changes of temperature, and by frequent and careful auscultation ascertain as near as may be the exact time when the changes in the lungs commence.

In an article of this kind it is unnecessary to enumerate the several symptoms, the physical signs, and the treatment of phthisis; they are described elsewhere in a manner to which we have no preten-

sion. Suffice it to say, that the disease commences generally when the patient is considered to be almost convalescent, that it runs a rapid course, and that it invariably leads to a fatal termination.

Erysipelas, like gangrene and pyæmia, is sometimes prevalent in hospital practice. Although sometimes fatal, it is not generally so. For the most part, small-pox patients attacked with it do well, albeit they may have a smart attack. The head and face are the parts most frequently affected. Sometimes pyæmia arises, leading to the formation of large accumulations of matter in various parts of the body, excessive prostration, and death.

The erysipelas commences suddenly, and generally about the second or third week of the small-pox attack; some heat and tingling is complained of in the nose, ear, or other part of the face; the swelling soon involves the whole of the eyelids, which assume an cedematous appearance, the eyes often being closed; it then spreads over the whole face and on to the scalp, sometimes extending to the throat and chest or back of the neck. This inflammation produces an effusion of fluid beneath the cuticle and cutis vera, forming blisters of various sizes; these breaking and discharging their contents, the cuticle dies off in scales, leaving reddish or bluish surfaces according to the constitutional power of the patient. Sometimes the skin and cellular tissue are both attacked, the liquor sanguinis is thrown out, and swelling occurs. This is frequently rapid and excessive—the skin becoming red, shining, very painful, and tense, and giving a brawny sensation when handled. Unless

speedy relief is afforded, suppuration occurs, extensive infiltration takes place, the system quickly sympathizes, and ultimately prostration and collapse ensue.

The *treatment* of the erythematous form of the disease is very simple, and consists in the application of hot, cold, or tepid water to the part (whichever is most grateful to the patient), or flour or starch-powder dusted over, often answers as well. It is advisable to try a different plan if the first does not answer our expectations quickly. Internally the tincture of perchloride of iron has succeeded best in those cases we have treated. It is also generally necessary to administer stimulants, as wine or brandy, and to insist upon a liberal supply of strong beef-tea.

In the phlegmonous form of erysipelas, our chief reliance must be placed in those means which tend to sustain the powers of the constitution, and by the treatment employed under ordinary circumstances.

Ulceration of the cornea is perhaps one of the most unfortunate results of confluent small-pox, leading, as it frequently does, to total destruction of the eye. It begins at various stages of the disease. We have seen it occur within the first week, and it has also been observed as late as the seventh. The second week is, however, the most frequent time for its occurrence. It commences with conjunctival inflammation, and is at first confined to that part of the membrane which lines the lids. It may be of any degree, from the slightest swelling to complete "chemosis." There is a good deal of itching and intolerance of light, and the edges of the lids are

noticed to adhere together after the patient has slept. After a short time (sometimes in a few hours) the inflammation extends to the conjunctiva, covering the eyeball; and if as yet there has been but little swelling of the eyelids, it is now augmented; at the same period a large discharge of pus occurs. The eyelids being constantly glued, the matter is shut up and escapes only after diligent bathing. Upon carefully examining the organ—which sometimes it is difficult to do—the vessels of the cornea are seen to be highly congested, and generally a small spot of ulceration near its margin. This spreads in a degree more or less rapid, either destroying the several layers of the cornea, and allowing the aqueous humour and iris to protrude through the aperture; or the progress is arrested, and an interstitial deposit takes place between the laminae, producing opacity, and effectually precluding the entrance of light. It has been observed that in many—in fact, the most cases, there has been almost complete absence of pain from first to last; but in some, on the contrary, the distress has been extreme.

It was formerly supposed that ulceration of the cornea arose from a variolous papule occurring upon that part. Without denying absolutely that such may be the case, we may state, that of 2500 patients that have passed under our observation, this condition of things never existed. The class of people usually attacked were those of a cachectic habit, or who had lived badly, or whose constitutional powers were undermined; it is attributed simply to defective nutrition.

Treatment.—Upon the first appearance of any redness, the patient should have the room darkened, and the eyes fomented frequently with hot water or poppy-head lotion. Mild aperients should be also given, and perhaps a blister applied behind the ear; we say “perhaps” as considerable difference of opinion exists as to the advisability of employing counter-irritation in the acute stage of the disease. Personally we do not consider it a valuable auxiliary, except in the advanced and chronic stage, and after other means have had a fair trial. An ulcer being discovered, should be touched either with the solid nitrate of silver or a drop of the solution (gr. x — gr. xv ad ʒj) placed in the eye night and morning. Before the application is made to the diseased eye, the discharge should be thoroughly removed by washing with either warm water, or a solution of alum and water, in the proportion of ʒj to Oj. Some simple cerate may also be applied to the lids, to prevent their sticking together. It is likewise desirable to increase the patient’s diet, and administer port wine and some ferruginous medicine, or quinine. If unfortunately the destruction continues and leads to the disastrous consequences mentioned before, we shall be obliged to content ourselves with the application of warm bread-and-water poultices, and sedative fomentations.

Tetanus, another complication, although happily but rarely seen, is worthy of mention. The notes of the only case that has come under our personal observation are as follows:—

C. O., aged seventeen, an errand boy, was

admitted on the evening of January 6th, 1872. The patient was quite well until the 3rd of January, when he complained of shivering and headache. On admission there were a few variolous papules on the face, trunk, and extremities, of a dark, hæmorrhagic character, with numerous dark purple spots on various parts of the body. He was completely unconscious, the mouth widely open, the face distorted, and the pupils dilated—the left more than the right. He was constantly shouting out, but no answer could be obtained to any question. He lay upon his left side with the legs drawn up; and when placed on his back, he rested upon the occiput and the heels, the body representing a complete arch. Fluid introduced into the mouth was rejected through the nostrils. Pulse 120°. Lungs clear. Pressure upon the neck by pinching produced no effect. Swallowing being impossible, enemata of beef-tea, &c. were given; and small doses of chloral hydrate produced slight relaxation of the muscular contraction, but otherwise did not appear to do any good. The patient remained in this condition until the afternoon of January 8th, when he died.

Post-mortem Examination.—On removing the calvaria considerable difficulty was experienced, owing to the firm adhesion of the dura mater. The brain was deeply congested over its whole surface, and appeared softer than usual. No fluid was found in the ventricles. On the under surface of the pons Varolii, extending along the under surface of the medulla oblongata (where it abruptly ended), was a thickish layer of concrete pus. On the posterior surface

of the medulla oblongata there was a similar layer of pus, which appeared to end at the junction of the medulla oblongata with the cord, the superior two inches of which were free from exudation ; but, with this exception, the posterior surface of the cord throughout its entire length was covered with exudation like that already described. The cauda equina was infiltrated with fluid pus. The anterior surface of the cord was quite free from exudation ; the cord itself was considerably congested. On examination by the microscope, numerous cells were seen ; these cells were full of granules, which disappeared on the addition of acetic acid. No change was observed in the nerve cells.

Pregnancy.—The sanguineous plethora which is usually more or less decided in pregnant women renders absorption more difficult, hence it is somewhat rare to find it complicated with small-pox ; when, however, it does occur, it becomes an unfortunate occurrence, and although some are delivered at either the full term or prematurely with favourable results, the reverse is generally the case. In those well vaccinated, the state of gestation is carried on apparently totally unaffected by the disease, and in the cases that have come under our notice, no appearance of rash has been discovered on the children ; the majority were still-born. For women to die with the foetus in utero is a rare occurrence. After parturition absorption becomes again easy, owing to the plethora being diminished by depletion of the vascular system, and by the comparative emptying of the abdomen caused by the decrease in the volume of the uterus ; so that after

labour, women resume their aptitude to receive the germs of contagious diseases; and in practice it will be found that a larger number of cases occur in women recently delivered than in those advanced in pregnancy.

The contagious power of small-pox is probably greater than that of any other disease: it may be communicated by inhaling the atmosphere of a chamber in which a small-pox patient is placed; it may be produced by coming into contact with the breath of the patient; and it appears that it may undoubtedly arise from handling or even remaining in the room with the corpse of one who has died from small-pox. But it must be admitted that it is often exceedingly difficult to discover the source of the malady, and sometimes after the most careful inquiry one fails to do so: the patient declares that no one with whom he is acquainted has had the disease, that the house he has been living in is free from it, and that in fact he is totally unable to give any account of its origin. Undoubtedly morbid germs may remain inactive and hidden for perhaps an indefinite time; waiting to manifest their presence until they meet with conditions favourable for their development, and “then coursing through the natural gates and alleys of the body, the poison doth with sudden vigour, posset and curd, like eager droppings into milk, the thin and wholesome blood.” Some persons, on the other hand, have an absolute power of resistance to disease, and pass unscathed through all kinds of epidemics, whilst others possess this immunity in a less degree, or only temporarily. If we ask, if anything can be suggested to

lessen this terrible danger to life, the answer is ready to our hands. "Disease is strong, but science is still stronger and more powerful. With what are called local and organic maladies we have not yet grappled, but zymotic epidemics are absolutely under our control; all that is needed to check them is to draw a cordon round the patient, and to disinfect or destroy what might carry mischief. All that comes from him, all that has even touched him, is charged with the deadly virus: a novel borrowed from the circulating library, a hansom cab, a first-class railway carriage, a pocket handkerchief—in short, the merest trifle, is sufficient to spread the poison far and wide. And, on the other hand, there is evidence sufficient to demonstrate even to the most sceptical that isolation and the circumscription of an adequate cordon of disinfectants round the person of the patient, will in almost every case stay the plague. Unfortunately the sense of personal responsibility is far too slight."

The following cases will show the power of the contagion of small-pox in those unprotected by vaccination:—

A man suffering from the severe confluent form of the malady was admitted into the hospital on December 7th, 1871. On the 10th his wife requested permission to see him. This was granted; she went into the ward, but remained sitting some feet from his bed for perhaps a quarter of an hour. On the 24th (or fourteen days after her visit), she was admitted with confluent small-pox, and died on the eleventh day of the attack.

The mother of a child admitted with malignant

small-pox, was informed that it was in a dying condition, and at her own desire was allowed to enter the ward. Upon doing so, she immediately and repeatedly kissed the child; sixteen days afterwards (the eruption having appeared two days previously) she was admitted with malignant small-pox, and died the following day.

That the disease may be communicated from the dead body is shown by Mr. Cæsar Hawkins, who relates the following interesting instance: The body of a man who died of small-pox was brought into his dissecting-room in Windmill Street, and four students took the disease, but only one had handled the corpse.

Trousseau also brings forward the following, in illustration of the same fact: "During the last century there was ordered the judicial examination of a person who had died of small-pox a great many years previously. The grave-digger who performed the exhumation, and some persons who were present when it was being done, took the disease; it soon afterwards broke out in the little parish in which occurred the events now mentioned, and where for many years small-pox had not been seen." Here we should be led to suppose that no one had actually touched the body, but the coffin only.

The period at which a patient may communicate the disease appears to extend from the time he himself has become infected, and before the rash has appeared on the body, to probably many months after all traces have disappeared, and when to all appearances, and as far as our judgment leads us to believe,

the patient is free from all contagion and justified in again mixing in society. The following, that occurred to one of the author's own friends, exemplifies the risk that one, not properly protected by vaccination, incurs by frequenting public assemblies. A young lady having suffered from small-pox, and who had taken the precaution to destroy everything that was likely to convey infection, attended public worship. My friend sat next to her during the service. After the usual number of days, she was found to be suffering from a smart attack of the disease, and with good reason traced the origin of infection to her neighbour at church.

That small-pox may be communicated by one who has visited a hospital to another at some distance from it, is, we think, well shown in the annexed example. On a Sunday, the sister of a patient remained some minutes in his company. Upon her returning home—distant some four miles or more—her husband, a railway porter, and consequently absent at his work all the week, received her upon her return, and stayed the evening and night in the same apartment. On the fourteenth day he was an inmate of the hospital.

Letters written by those suffering from the disorder may convey the infection of small-pox. A patient having been in the hospital for above two months, wrote to her sister in Dublin. At the end of a fortnight she received news that she was laid up with the same disease.

It is beyond doubt that individuals may become infected without entering the hospital building, but by

engaging in work in the out-buildings, handling tools used by small-pox patients, mixing in the society of nurses and others engaged in watching the sick.

Very recently a fresh supply of beer was required in this hospital: two draymen were engaged in lowering the same into the cellar and withdrawing the empty casks. Exactly fourteen days afterwards one was admitted with malignant small-pox, which in about forty-eight hours terminated his existence. These facts, which might almost be indefinitely multiplied, teach us that the risk is so great that the question has often presented itself to our minds whether it is not exceedingly impolitic to admit those who, either from carelessness, want of knowledge, or what is very common, want of faith, have neglected to protect themselves by vaccination. That there is a difficulty in the case of those who will in all probability succumb to the disease, and who very naturally are anxious to see the friends most beloved by them, we are ready to admit; but as the danger of infection is totally and beyond all doubt removed by the simple operation of vaccination, a terrible responsibility devolves upon those in authority, who, by their consent, and consequently through their agency, assist in spreading a most fatal and loathsome malady amongst the great centres of the population. If the relatives of the class of people admitted into special hospitals were informed that under no circumstances whatever could they be permitted to see their friends whilst inmates without first producing a certificate of successful vaccination or re-vaccination (according to age) the difficulty and danger would readily be overcome.

The question as to when a patient after an attack of small-pox is free from contagion; or, in other words, can contagious morbid germs remain in an inert state external to organic life? involves considerable difficulty in its reply. The case related by Trousseau would teach us that the variolous germ wrapped up, laid by, lost to sight, and absolutely forgotten, is still capable of developing itself with great power in persons predisposed to receive it. The absence of scabs appears to be looked upon as the most conclusive proof of a patient having lost the power of communicating small-pox; but to those who are in the daily habit of seeing cases, and watching them for a considerable time, a continued and repeated crop of branny scales are observed, and which appear to be renewed for an indefinite term. That they possess the power of propagating the disease is a subject deserving consideration, for it being proved that they have such a power, the length of time for which those recovering from small-pox should be kept in quarantine would be increased considerably—certainly much longer than is now considered necessary.

In giving an opinion as to the patient being free from contagion, it will be necessary to closely examine every part of the body. In a prolonged attack of small-pox the nails of the hands and feet become necessarily much elongated, and we have seen squamulæ accumulated there to an extent that would beyond doubt give rise to the disease. It is necessary, then, to have the nails cut as close as possible, and thoroughly cleansed in the ordinary manner previously to allowing the patient his freedom. The hair and

whiskers likewise having grown during the illness become the means of lodging a large amount of cast-off epithelium. These, then, should be removed if we would take every precautionary measure.

Infected Clothing.—In reference to infected clothing it is by far the best to have the whole destroyed, as also the bedding. But in hospitals, where this is not practicable, the only disinfection that is found to be thoroughly trustworthy is to place them in a chamber of which the temperature is about 220° F.; having remained there for one hour, and then being exposed freely to the air, they are believed to be thoroughly free from contagion. Washing with carbolic acid and burning sulphur in the chamber have both been tried, but unless associated with the hot-air chamber are not considered to be reliable. Featherbeds should be taken to pieces, sprinkled with carbolic acid, and exposed to the degree of temperature above mentioned.

Variola Hæmorrhagica.—We now pass on to consider a very serious and fatal form of small-pox, which, although evidently but little understood by the older writers, nevertheless did not escape their observation. I refer to the petechial or hæmorrhagic type of the disease, and the characters of which are as follows: The general surface of the skin, but more particularly that of the axillæ, lower border of the breasts, and groins are covered with a dark petechial rash; there is also seen on the face and arms a sparse amount of variolous eruption, but of a much darker colour than normal, and not elevated to the extent it should be. The skin between the papules partakes also of the redness, rendering it difficult some-

times, unless attentively observed, to distinguish the rash from the cuticle; the conjunctivæ are generally injected more or less. There is hæmorrhage from the nose, lungs, stomach, bladder, bowels, or uterus, and sometimes from them all at the same time; and there is almost always delirium, varying in intensity and amount. The temperature in these cases will, as a rule, be found to be low, but not to the extent that it is in the malignant form, and it remains so unless a fatal termination takes place. I say, unless a fatal termination takes place, because I am sure that many recover, and that the much respected Sir Thomas Watson was in error when he penned the following passage: "In one most fearful phase of this (small-pox) always formidable disorder, symptoms indicative of what is called the putrid diathesis manifest themselves—petechiæ, vibices, hæmorrhages from various parts of the body. The pustules, instead of being plump and yellow, are flat, red, purple, or blue; that is, they contain blood or a sanious ichor in the place of pus, constituting the variolæ nigræ of Sydenham, the bloody small-pox of Mead. *I believe that these appearances augur in all cases a fatal result.*"

It is doubtful if Sydenham or Mead recognised the two forms of small-pox which we have respectively named hæmorrhagic and malignant, or whether they did not consider them one and the same. On the third or fourth day of the eruption, the vesicles are generally more plainly developed, but are still filled with what is probably blood. Almost invariably there is some chest complication—usually a low form of broncho-pneumonia; the expectoration of rusty-

coloured mucus is frequently great, but, as a rule, when this is established, the hæmorrhage from the other mucous surfaces ceases, or at least is abated. In order to illustrate this class of the disease, I append the notes of two cases—one in which the result was fatal, in the other favourable:—

J. T., aged twenty-four, shoemaker, was admitted on the morning of April 10th, 1872.

Previous History.—Had always enjoyed good health until he contracted the present disease. His habits have been moderately regular, but, like the class to which he belongs, has now and then taken too much drink. He has had no known contact with a person suffering from small-pox.

Condition on Admission. — There is a moderate quantity of rash, scarcely raised above the surface of the skin, which is of a dark brick-dust colour; that on the arms and legs almost black. Blood is escaping from both nostrils; he also spat blood last evening, and thinks he passed some by the bowels. The conjunctivæ are deeply injected—the right more than the left; the tongue is fevered, but moist. He answers questions rationally when pressed, but immediately relapses into a low muttering delirium. This is the fourth day of the eruption.

Morning, Temp. $100\cdot2^{\circ}$. Pulse 100 . Resp. 24.

Evening, „ 100° . „ 104 . „ 24.

5th day.—Has had some sleep during the night, but in the earlier part was very troublesome. Got out of bed every time the nurse left his side, but was

easily persuaded to return. Tongue moist, and cleaner than yesterday. Bowels open without medicine.

Morning, Temp. $100\cdot8^{\circ}$. Pulse 120 . Resp. 28.

Evening, „ 100° . „ 110 . „ 24.

6th day.—Is less delirious; the face is swollen a little; tongue remains moist, but not so clean; has had more sleep, and is not at all troublesome.

Morning, Temp. $99\cdot4^{\circ}$. Pulse 108 . Resp. 28.

Evening, „ $101\cdot2^{\circ}$. „ 112 . „ 20.

7th day.—Has been very delirious again; the rash over the whole body is now uniformly of a purplish, almost black colour; the conjunctivæ continue deeply injected; has had no sleep; tongue much furred.

Morning, Temp. 101° . Pulse 120 . Resp. 28.

Evening, „ $101\cdot4^{\circ}$. „ 128 . „ 28.

8th day.—There is great and continued restlessness; no sleep during the whole of the night; the breathing is much hurried; over the whole of the right and some portion of the left lung fine crepitation is heard; there is likewise considerable dulness on percussion; heart sounds healthy; the expectoration is viscid, and streaked with blood.

Morning, Temp. $101\cdot8^{\circ}$. Pulse 120 . Resp. 32.

Evening, „ 103° . „ 120 . „ 40.

9th day.—He is evidently dying; with some trouble he replies to questions; there is constant low muttering delirium, and he frequently makes attempts to get out of bed; his urine and fæces pass involuntarily; the mucous râles have much increased, but he has no power to expectorate.

Morning, Temp. $101\cdot4^{\circ}$. Pulse 124 . Resp. 32.

Evening, „ $103\cdot6^{\circ}$. „ N.C. . „ 60.

Death took place at 5 o'clock the following morning.

The second case is that of a woman, aged twenty-eight, admitted in May, 1872.

Previous History.—With the exception of three confinements, had never known what it was to keep her bed on account of illness; as the wife of a labourer in the docks, has necessarily had to work hard at her domestic duties. A little beer once a day is the only stimulant she has had for many years. Several in the same street in which she has resided have suffered from small-pox, but she does not remember having been in contact with any of them. Upon further inquiry she admits having made purchases at a general shop where a child had recently died from the disorder, but she is unable to remember the date of her last visit there.

Condition on Admission.—The whole surface of the body is of a dark colour, not unlike that of a boiled lobster. On the forehead and forearms a minute rash is observed, something like scarlatina. Below each knee, and on the dorsum of the left, patches of ecchymosis, about the size of half-a-crown, are noticed. The colour of the skin at the lower portion of the abdomen and the upper and inner parts of the thighs is of a much darker hue than that of the trunk and upper extremities. Her last child is three months old, and she has had a plentiful supply of milk until the last five days; there is now considerable uterine hæmorrhage, also hæmoptysis, and slight epistaxis.

There is now no delirium ; but last night she says she saw "all kinds of queer things ;" both conjunctivæ are deeply injected, and the tongue is covered with a yellowish fur. The eruption has been present five days.

Morning, Temp. 100° . Pulse 130.

Evening, „ 99.6° . „ 120.

6th day.—The hæmorrhage has much decreased, and she has slept tolerably well. In the earlier part of the night there was considerable delirium, but towards morning, passed off. Bowels have been relieved once by medicine ; tongue cleaner.

Morning, Temp. 100.4° . Pulse 120.

Evening, „ 100.2° . „ 110.

7th day.—There is more development of the rash, but the vesicles are of a bluish colour, and flattened ; the hæmorrhage has almost gone ; the mental faculties are clear, and she takes nourishment freely.

Morning, Temp. 100.6° . Pulse 120.

Evening, „ 102° . „ 112.

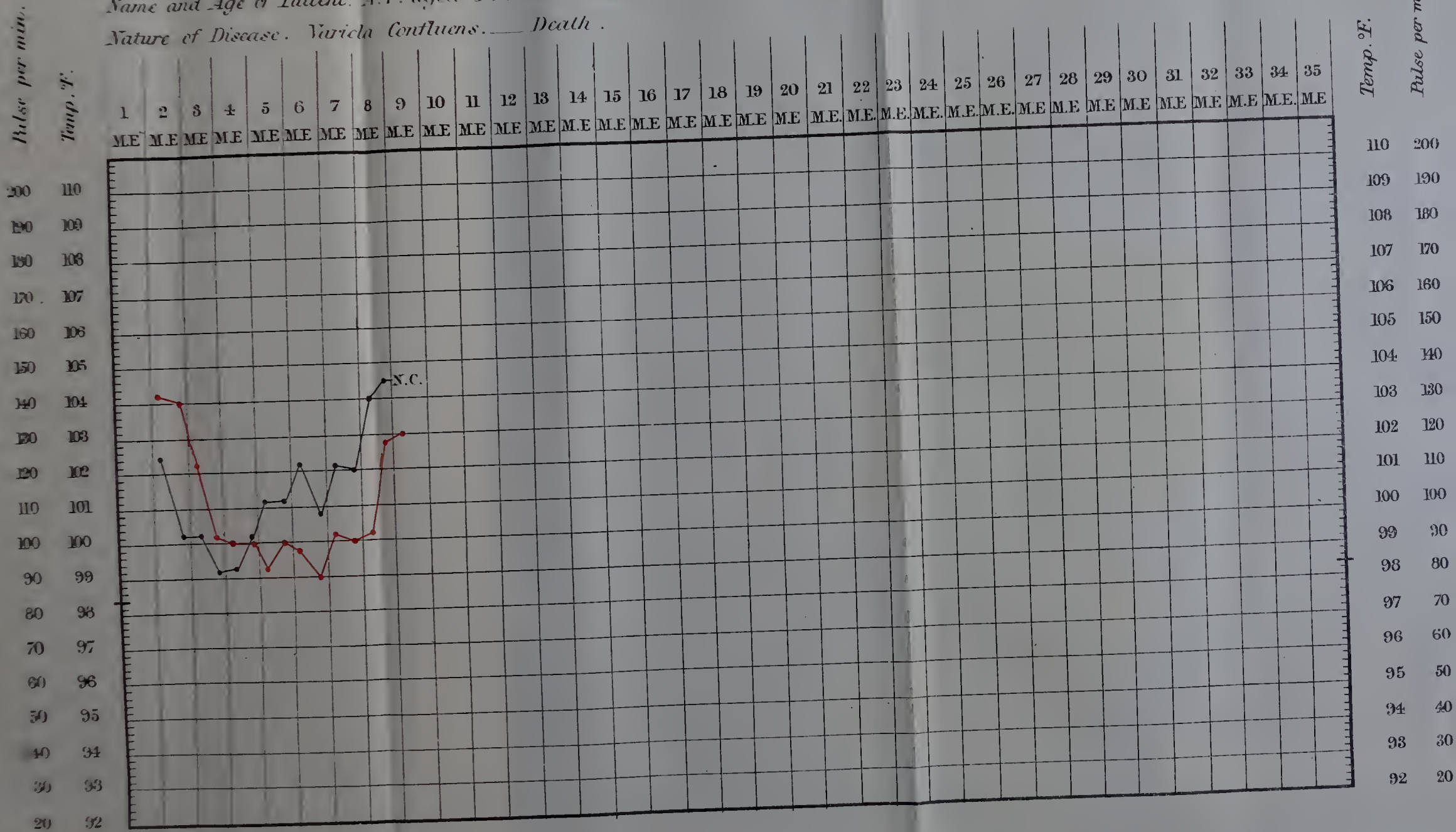
8th day.—The hæmorrhage from the uterus again returned during the night, and continues freely. She has likewise been very delirious and difficult to manage ; there is no increased development of the vesicles ; the bruise-like patches on the legs are partially faded.

Morning, Temp. 102° . Pulse 118.

Evening, „ 101.6° . „ 130.

Name and Age of Patient. A.T. aged 32. Vaccinated with one very Imperfect mark.

Nature of Disease. Varicla Confluens. — Death.





9th day.—Although still very delirious, she appears to be too low to attempt getting out of bed; the loss she has sustained during the past twenty-four hours has been very great. Her tongue is, however, moist; and the appearance in the colour of the rash improved.

Morning, Temp. $101\cdot6^{\circ}$. Pulse 134.

Evening, „ $100\cdot8^{\circ}$. „ 110.

It would answer no purpose to continue the daily account of this patient; the accompanying chart shows very clearly the many variations of temperature and pulse that took place, extending over a period of thirty-one days, after which it was considered unnecessary to register the same. Her residence in the hospital was altogether about three months, and at the time of leaving she was in a perfect state of health; to use her own words—“I feel better now than I did before I had small-pox.” It will be noticed that the uterine hæmorrhage again returned on the fifteenth evening; this shows the necessity of carefully watching our cases closely, even when dangerous symptoms have apparently entirely passed away. The diarrhœa I was inclined to attribute to a slight error in diet.

Having briefly, and, we fear, very imperfectly, considered those forms of small-pox which admit of some beneficial treatment, there only remains for us to mention one which runs a rapid and certain course—a form which attacks equally the young, the middle-aged, and the old—a form in which medicine is impotent to alleviate—a form in which the result is certain death. We refer to the—

Malignant, or Black Small-Pox.—The premonitory symptoms of this type of the disease are much the same as in the confluent or discrete, but the pain in the back is usually more severe; indeed, so much so, that we have seen cases in which the patient was unable to raise himself from the recumbent posture, and complained bitterly if others attempted to interfere with his position. In one or two other cases we have known the pain continue until death, all remedies apparently being useless. The precursory fever does not appear to be so high as in the other classes of the disorder, the temperature rarely rising above 103° F. This is also seldom maintained except for the first forty-eight hours, when it frequently gets below the normal standard, and remains so until a few hours before death; it then rises again, sometimes as high as 105° or 106° , but as frequently not more than 101° . There is absolutely no eruption proper, but taking its place is a leaden or bluish discoloration of the whole surface of the body, in which papules of a black or purple hue are seen here and there, sometimes in large numbers, sometimes sparsely scattered. The odour from the lungs and general surface of the body is horrible. An indescribable stench, something like rotten fish—a smell, which if once brought into contact with, is never to be forgotten—it is the most nauseous that can possibly assail the nostrils.* There

* This smell is not peculiar to small-pox. It is sometimes met with in typhus and other exanthemata, and I have met with it in acute rheumatism. It has been attributed, and I think justly, to the production of a compound ammonia, trimethylamine (C_2H_7N), which

is almost always some amount of hæmorrhage, either from the nose, lungs, stomach, bladder, uterus, or rectum. The conjunctivæ are deeply injected, frequently so much so as to form absolute "chemosis;" the inguinal glands are enlarged, but rarely painful; so also are sometimes the axillary and cervical. If the patient lives for four or five days, quasi vario-
lous vesicles may be developed, but they differ from the true ones by being filled with blood or something like it, instead of pus. They never arrive at the pustular stage. The mental faculties in these cases are perfectly clear from first to last, and we have frequently received a clear account of the origin and mode of infection from the patient within an hour or so of his dissolution. It is rarely that these cases live until the eighth day, death usually taking place about the fourth or fifth. After the peculiar symptoms have once been established, there can be no ground therefore for the recommendation of any especial drug or form of medicine, or even for any general plan of treatment.

There is no well-authenticated case on record, we believe, of black small-pox having recovered: as it has been, so it is now, the physician that cures is Death. And until the late epidemic, we should be led to infer that the number of cases coming under observation had been comparatively rare; at least, but few have written such an account of this form of the disease as would be an efficient aid to diagnosis.

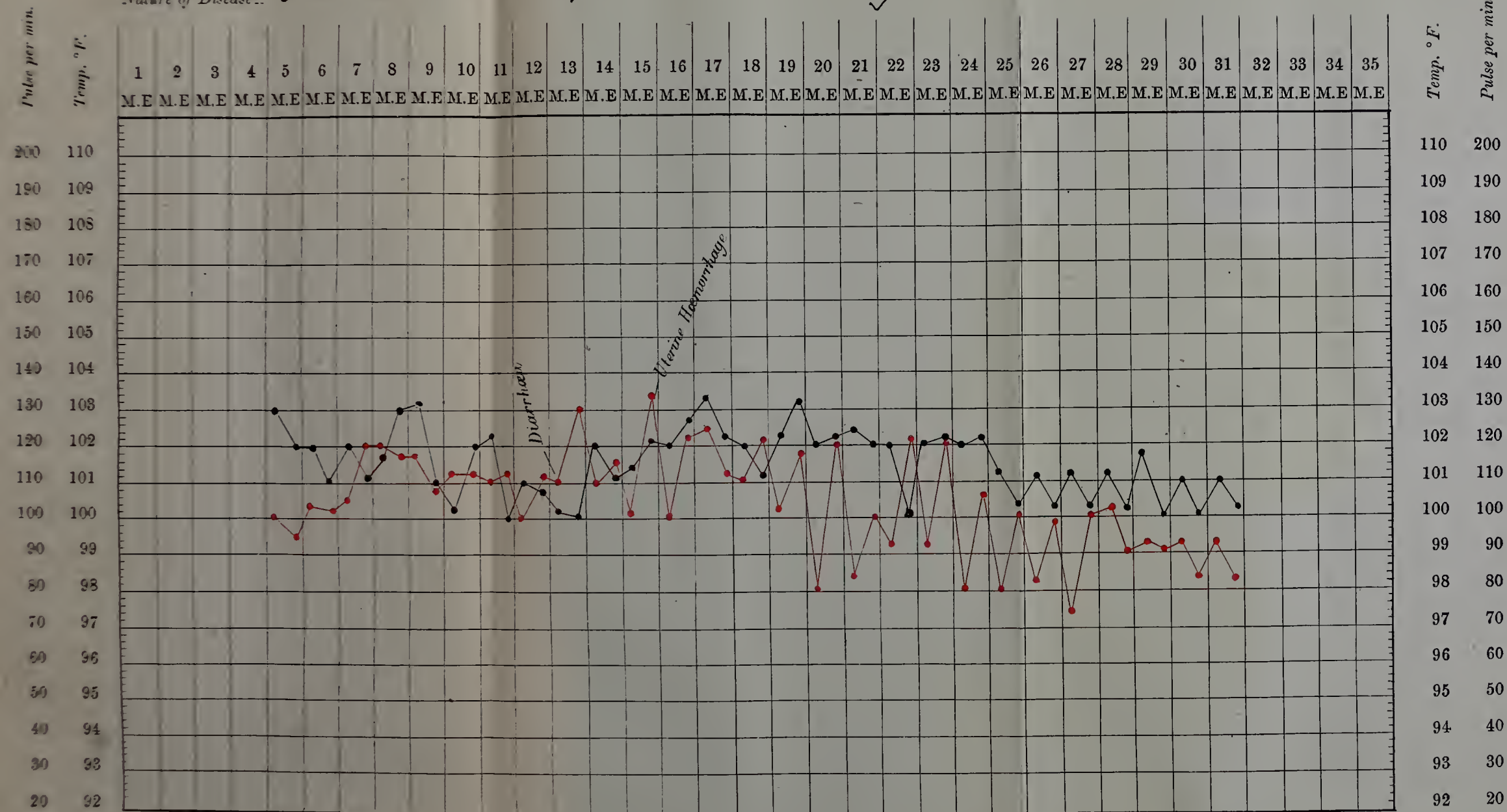
is also found in herring-brine, and is an occasional constituent of human urine.

The post-mortem appearances in these cases are unsatisfactory. Beyond great congestion of the lungs, heart, and indeed all the internal organs, with patches on the mucous and serous membranes, nothing will be found peculiar to small-pox. We have never seen anything resembling a variolous eruption beyond the mouth and larynx.*

The annexed charts illustrate the temperatures usually noted in this form of small-pox.

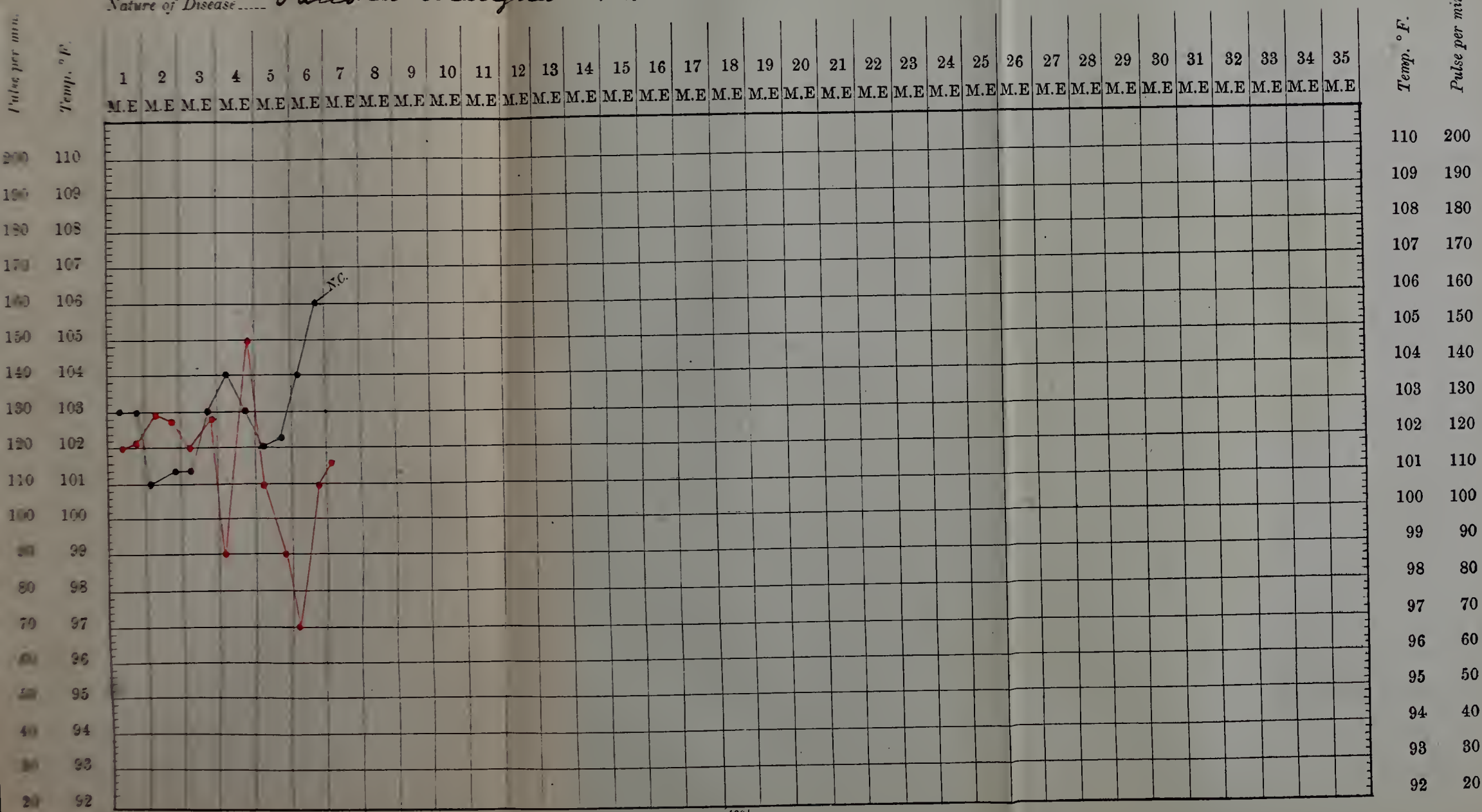
* For an interesting account of the post-mortem appearances after small-pox, see "Beiträge zur Pathologie und Therapie der Variola." By Dr. W. Zuelzer, Medical Superintendent in the *Charité* Hospital, and Professor in the University of Berlin. (Berlin. Klinische Wochenschrift, 1872. No. 51, ff.)

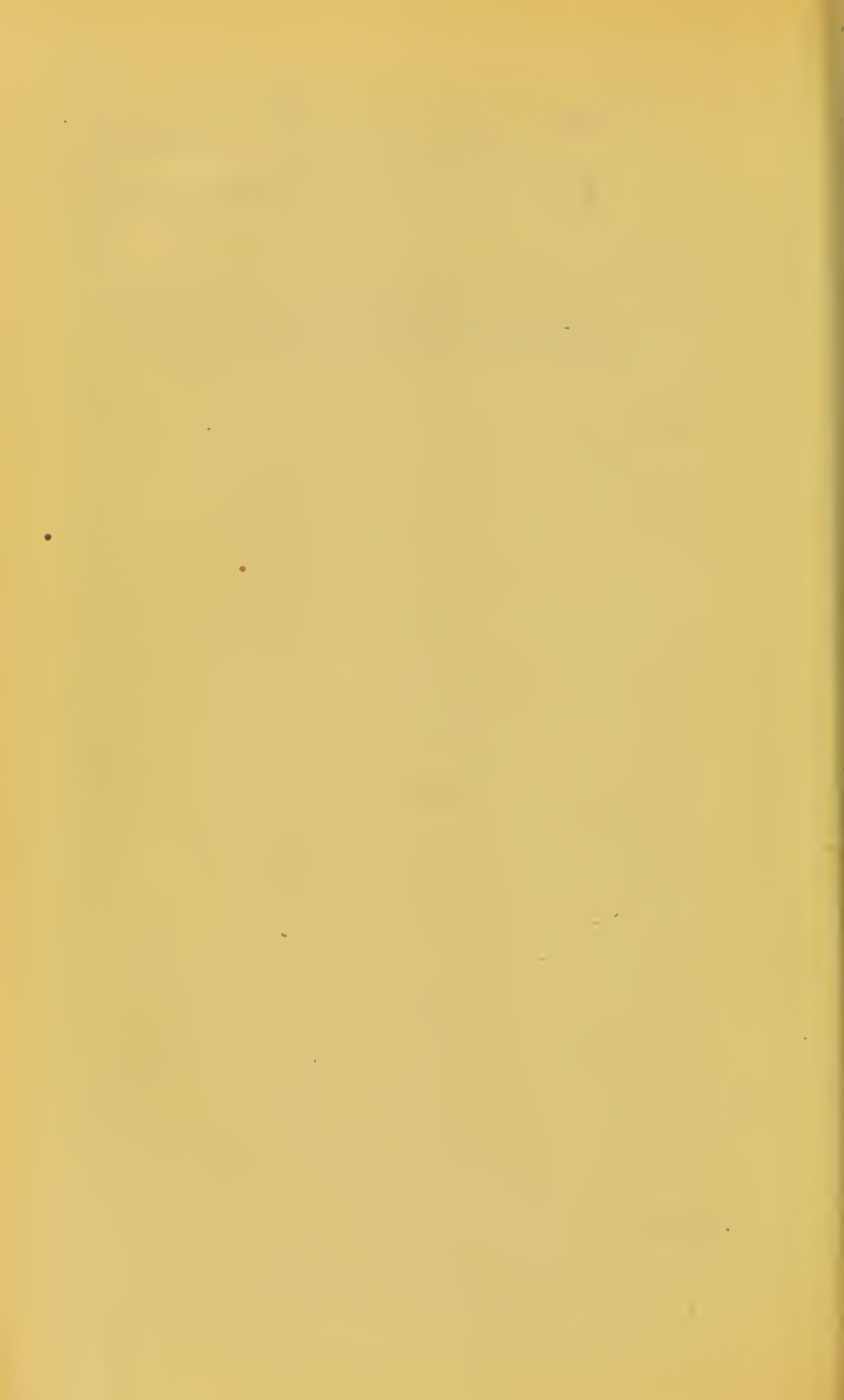
Name and Age of Patient.. *E. R. aged 28. Not Vaccinated*
 Nature of Disease.. *Varicella Hemorrhagica. Recovery.*



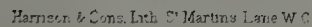
Name and Age of Patient... *J. W. aged 45. Vaccinated, no marks.*

Nature of Disease... *Varicella Maligna. Death.*





Nature of Disease.... Variola Maligna - Death.



Name and Age of Patient... *R. J. aged 31. Not Vaccinated.*

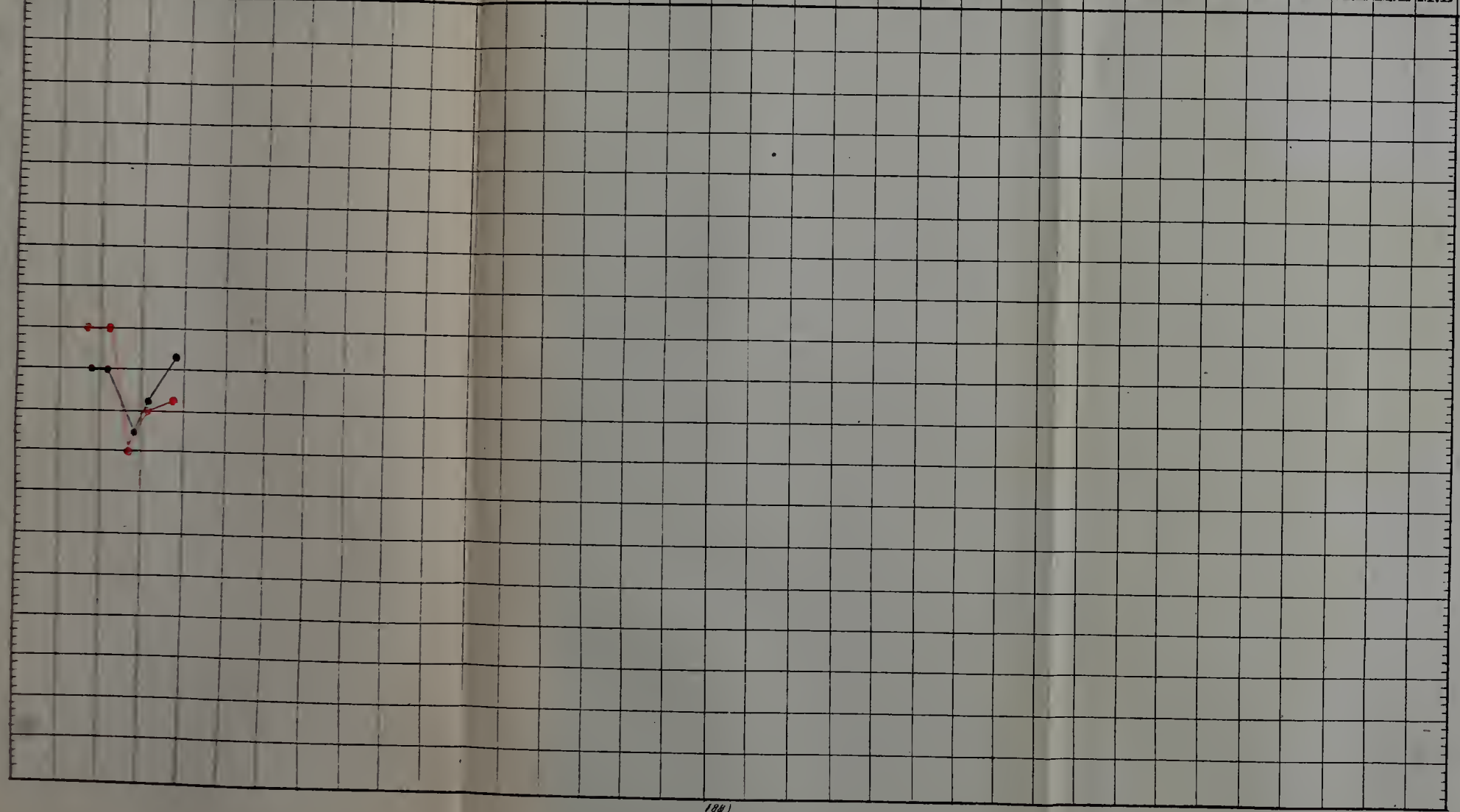
Nature of Disease... *Varicella Maligna. Death.*

Pulse per min.

Temp. °F.

200 110
190 109
180 108
170 107
160 106
150 105
140 104
130 103
120 102
110 101
100 100
90 99
80 98
70 97
60 96
50 95
40 94
30 93
20 92

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	M.E.	



Temp. °F.

Pulse per min.

110 200
109 190
108 180
107 170
106 160
105 150
104 140
103 130
102 120
101 110
100 100
99 90
98 80
97 70
96 60
95 50
94 40
93 30
92 20

